IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A method of processing data received in a transport stream format to produce a modified transport stream for recording on a recording medium to record wanted content of a selected audio-visual program, the received transport stream comprising a multiplex of elementary streams conveying not only the wanted content but also unwanted content of other programs not to be recorded, said elementary streams of data having been encoded, divided into elementary stream (ES) packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of first and second elementary streams interleaved in the received transport stream with each other and with transport packets carrying data from neither stream, wherein the said modified transport stream is produced by:

identifying and selecting received transport packets which correspond to the wanted content;

recording the selected transport packets within a recording medium to form said modified transport stream, so as to preserve compliance with a transport stream target decoder model substantially without repacketizing or remultiplexing the streams; and

recording auxiliary information on the same recording medium for use by a reproducing apparatus in gaining access to the content of the modified transport stream via any of a set of potential entry points throughout the wanted content.

2. (Previously presented) The method as claimed in claim 1 wherein said auxiliary information includes information stored in a file separately from a file holding the modified transport stream.

3. (Previously presented) The method as claimed in claim 2 wherein said auxiliary information comprises an index listing characteristic points within at least one of the wanted elementary streams, and is obtained by parsing the elementary stream to

identify individual access units offering a valid entry point for decoding said at least one elementary stream.

4. (Previously presented) The method as claimed in claim 3 wherein said characteristic points are defined with a frequency substantially greater than one per second on the presentation time scale.

5. (Previously presented) The method as claimed in claim 3 wherein said characteristic points are defined with reference to a video elementary stream, each referring to an intra-coded picture data.

6. (Previously presented) The method as claimed in claim 1 wherein at least part of said auxiliary information is recorded within the modified transport stream.

7. (Previously presented) The method as claimed in claim 1 wherein the received transport stream occasionally includes stream mapping information identifying a transport packet ID code

associated with each elementary stream, said stream mapping information being used to identify the wanted content and being subject to change throughout the received transport stream, and wherein at least part of said auxiliary information is created by parsing the received transport stream to extract the mapping information, and recorded so that current mapping information is accessible at each potential entry point without parsing the modified transport stream prior to the entry point.

8. (Previously presented) The method as claimed in claim 6 wherein at least part of said auxiliary information comprises additional transport packets inserted at each potential entry point in the modified transport stream.

9. (Previously presented) The method as claimed in claim 6, wherein at least part of said auxiliary information overwrites header information received within the transport packets, in order to define the modified transport stream.

10. (Previously presented) The method as claimed in claim 9

wherein the received transport stream occasionally includes stream mapping information identifying a transport packet ID code associated with each elementary stream, said stream mapping information being used to identify the wanted content and being subject to change throughout the received transport stream, wherein said auxiliary information overwrites packet ID codes in the transport packets so as to re-map the wanted content to a uniform set of ID codes throughout the modified transport stream.

11. (Previously presented) The method as claimed in claim 1, including the acts of :

identifying in the received data an elementary stream conveying auxiliary data useful in playback of the program to be recorded; and

in the case where the elementary stream conveying the auxiliary data is one conveying part of the unwanted content, generating a new elementary stream conveying the auxiliary data without the unwanted content.

12. (Previously presented) The method according to claim 11

wherein the auxiliary data comprises clock reference data for synchronizing playback of the elementary streams.

13. (Previously presented) The method as claimed in claim 1, wherein said elementary streams comprise at least video and audio of an audio-visual program to be recorded.

14. (Previously presented) The method as claimed in claim 1, wherein said received transport stream is compliant with the MPEG transport stream specification.

15. (Previously presented) The method as claimed in claim 1, further comprising:

reproducing stored program segments with a timing different to that of the received transport stream, in accordance with user command, by reading the recorded auxiliary information and using it to enter and commence reproduction by reading said modified transport stream from a desired entry point.

16. (Previously presented) The method as claimed in claim 15

wherein said reproducing is performed to effect a trick play mode of a frame-based elementary stream, using the auxiliary information to step through the program while presenting a subset of frames to a user, by reading said modified transport stream at a succession of entry points.

17. (Previously presented) The method as claimed in claim 15 wherein said auxiliary information is read and used implicitly as part of a standard decoding of the modified transport stream.

18. (Previously presented) The method as claimed in claim 15 wherein said auxiliary information is read and used to modify further the transport stream as reproduced from the recording medium, prior to standard decoding of the further modified transport stream.

19. (Currently amended) A microprocessor readable recording medium comprising a modified transport stream arranged for accessing wanted content within the modified transport stream by a reproducing apparatus, the modified transport stream comprising:

a multiplex of elementary streams conveying not only the wanted content but also unwanted content of other programs, said elementary streams of data having been encoded, divided into elementary stream (ES) packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of first and second elementary streams interleaved in the transport stream with each other and with transport packets carrying data from neither stream;

identified and selected transport packets which correspond to the wanted content configured to preserve compliance with a transport stream target decoder model substantially without repacketizing or remultiplexing the streams; and

auxiliary information for use by ~~a~~ the reproducing apparatus in gaining access to the content of the modified transport stream via any of a set of potential entry points throughout the wanted content.

20. (Currently amended) A decoder arranged to decode a modified transport stream embedded in a signal~~, said modified transport stream being configured for recording on a recording~~

~~medium,~~ and to select from the signal, wanted content of a selected audio-visual program, said modified transport stream comprising:

a multiplex of elementary streams conveying not only the wanted content but also unwanted content of other programs ~~not to be recorded~~, said elementary streams of data having been encoded, divided into elementary stream (ES) packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of first and second elementary streams interleaved in the transport stream with each other and with transport packets carrying data from neither stream;

the decoder being arranged to identify and select~~identified and selected~~ transport packets which correspond to the wanted content ~~configured~~ and to preserve compliance with a transport stream target decoder model substantially without repacketizing or remultiplexing the streams~~,~~ and

to utilize auxiliary information ~~for use by a reproducing apparatus in gaining~~to gain access to the content of the modified transport stream via any of a set of potential entry points throughout the wanted content.

21. (Currently amended) The ~~signal~~ decoder as claimed in claim 20 wherein said modified transport stream has been reproduced from ~~said~~ a recording medium by reproducing stored program segments with a timing different to that of the received transport stream, in accordance with a user command, by reading the recorded auxiliary information and using the recorded auxiliary information to enter and commence reproduction by reading said modified transport stream from a desired entry point.

22. (Currently amended) An apparatus for providing a multiplex of elementary stream data received in a transport format comprising a multiplex of elementary streams conveying not only ~~the~~ wanted content but also unwanted content of other programs, said elementary streams of data having been encoded, divided into elementary stream (ES) packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of first and second elementary streams interleaved in the received transport stream with each other and with transport packets carrying data from neither stream, the apparatus comprising means specifically adapted to generate a

modified transport stream by identifying and selecting received transport packets which correspond to the wanted content, providing the selected transport packets to form said modified transport stream, so as to preserve compliance with a transport stream target decoder model substantially without repacketizing or remultiplexing the streams; and

providing auxiliary information as a part of said modified transport stream for use by a reproducing apparatus in gaining access to the content of the modified transport stream via any of a set of potential entry points throughout the wanted content.

23. (Previously presented) The apparatus as claimed in claim 22 further comprising means for reproducing said modified transport stream by reproducing program segments with a timing different to that of the received transport stream, in accordance with user command, by reading the auxiliary information and using the auxiliary information to enter and commence reproduction by reading said modified transport stream from a desired entry point.

24. (Previously presented) A method of processing a received

data stream to produce a modified stream for recording on a recording medium to record wanted content of a selected audio-visual program, the received data stream comprising a multiplex of elementary streams conveying not only the wanted content but also unwanted content of other programs not to be recorded, the method comprising:

identifying and extracting from the received data stream the elementary data stream(s) conveying the wanted content;

identifying in the received data an elementary stream conveying auxiliary data useful in playback of the program to be recorded;

in the case where the elementary stream conveying the auxiliary data is one conveying part of the unwanted content, generating a new elementary stream conveying the auxiliary data without that part of the unwanted content; and

multiplexing together the elementary stream(s) extracted from the received stream with the new elementary stream to form said modified data stream for recording.

25. (Previously presented) The method according to claim 24

wherein the auxiliary data comprises a clock reference data for synchronizing playback of the audio-visual program.

26. (Previously presented) The method according to claim 24 wherein the received data stream is an MPEG-compliant Transport Stream as defined in ISO/IEC 13818-1 and the auxiliary data comprises the Program Clock Reference as defined therein.

27. (Previously presented) A method of processing data received in a transport stream format of elementary streams of data, to produce a modified transport stream for recording on a recording medium to record wanted content of a selected audio-visual program, said elementary streams of data having been encoded, divided into elementary stream packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of the first and second elementary streams interleaved in the received transport stream with each other and with transport packets carrying data from neither stream, and wherein the received transport stream occasionally includes stream mapping information identifying a

transport packet ID code associated with each elementary stream, said stream mapping information being subject to change throughout the received transport stream, wherein the said modified transport stream is produced by:

identifying received transport packets which correspond to the wanted content using said stream mapping information;

modifying packet ID codes in the transport packets so as to re-map the wanted content to a uniform set of ID codes according to content type of the transport packets;

recording the selected transport packets within a recording medium to form said modified transport stream, thereby to preserve compliance with a transport stream target decoder model and provide a greater number of potential entry points than in the received stream.

28. (Currently amended) A method of processing data received in a transport stream format of elementary streams of data, to produce a modified transport stream for recording on a recording medium to record ~~the~~ wanted content of a selected audio-visual program as wanted content, said elementary streams of data having

been encoded, divided into elementary stream packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of the first and second elementary streams interleaved in the received transport stream with each other and with transport packets carrying data from neither stream, and wherein the received transport stream occasionally includes stream mapping information identifying a transport packet ID code associated with each elementary stream, said stream mapping information being subject to change throughout the received transport stream, wherein the said modified transport stream is produced by:

identifying received transport packets which correspond to the wanted content using said stream mapping information;

parsing the receive transport packets to obtain said mapping information for potential entry points throughout at least one of the elementary streams;

recording the selected transport packets together with said auxiliary information within a recording medium to form said modified transport stream, thereby to preserve compliance with a transport stream target decoder model and while providing a greater

number of potential entry points than in the received stream.

29. (Previously presented) The method as claimed in claim 27 wherein at least part of said auxiliary information comprises additional transport packets inserted to reproduce current mapping information at each potential entry point in the modified transport stream.

30. (Canceled)

31. (Canceled)

32. (Previously presented) An apparatus for recording a multiplex of elementary stream data received in a transport format comprising a multiplex of elementary streams conveying not only wanted content but also unwanted content of other programs not to be recorded, the apparatus comprising means specifically adapted to generate and record a modified transport stream by identifying and extracting from the received data stream the elementary data stream(s) conveying the wanted content, identifying in the received

data an elementary stream conveying auxiliary data useful in playback of the program to be recorded, in the case where the elementary stream conveying the auxiliary data is one conveying part of the unwanted content, generating a new elementary stream conveying the auxiliary data without that part of the unwanted content, and multiplexing together the elementary stream(s) extracted from the received stream with the new elementary stream to form said modified data stream for recording.

33. (Previously presented) An apparatus as claimed in claim 32 further comprising means for reproducing said modified transport stream by reproducing stored program segments with a timing different to that of the received transport stream, in accordance with user command, by reading the recorded auxiliary information and using the recorded auxiliary information to enter and commence reproduction by reading said modified transport stream from a desired entry point.

34. (Canceled)

35. (Canceled)

36. (Currently amended) An apparatus for recording a multiplex of elementary stream data received in a transport format of elementary streams of data, said elementary streams of data having been encoded, divided into elementary stream packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of the first and second elementary streams interleaved in the received transport stream with each other and with transport packets carrying data from neither stream, and wherein the received transport stream occasionally includes stream mapping information identifying a transport packet ID code associated with each elementary stream, said stream mapping information being subject to change throughout the received transport stream, the apparatus comprising means specifically adapted to generate and record a modified transport stream by identifying received transport packets which correspond to ~~the~~ wanted content using said stream mapping information, modifying packet ID codes in the transport packets so as to re-map the wanted content to a uniform set of ID codes

according to content type of the transport packets, and recording the selected transport packets within a recording medium to form said modified transport stream, thereby to preserve compliance with a transport stream target decoder model and provide a greater number of potential entry points than in the received stream.

37. (Canceled)

38. (Canceled)

39. (Previously presented) An apparatus for recording a multiplex of elementary stream data received in a transport format of elementary streams of data, said elementary streams of data having been encoded, divided into elementary stream packets with packet headers, the ES packets further sub-divided into a plurality of smaller transport packets, and the transport packets of the first and second elementary streams interleaved in the received transport stream with each other and with transport packets carrying data from neither stream, and wherein the received transport stream occasionally includes stream mapping information

identifying a transport packet ID code associated with each elementary stream, said stream mapping information being subject to change throughout the received transport stream, the apparatus comprising means specifically adapted to generate and record a modified transport stream by identifying received transport packets which correspond to wanted content using said stream mapping information, parsing the receive transport packets to obtain said mapping information for potential entry points throughout at least one of the elementary streams, and recording the selected transport packets together with said auxiliary information within a recording medium to form said modified transport stream, thereby to preserve compliance with a transport stream target decoder model and while providing a greater number of potential entry points than in the received stream.

40. (Previously presented) A method comprising:

identifying and selecting transport packets which correspond to wanted content of a wanted program from a multiplexed transport stream comprising multiple elementary streams conveying not only the wanted content of the wanted program but also unwanted

content of other programs that are not wanted, the elementary streams of data having been encoded and divided into elementary stream packets with packet headers, the ES packets being further sub-divided into a plurality of smaller transport packets, and the transport packets of a first and second elementary streams being interleaved in the multiplexed transport stream with each other and with transport packets carrying data from neither the first or second stream;

forming a modified transport stream containing the selected packets so as to preserve compliance with a transport stream target decoder model substantially without repacketizing or remultiplexing the streams;

generating auxiliary information for use by a reproducing apparatus in gaining access to the content of the modified transport stream via any of a set of potential entry points throughout the wanted content; and

transmitting the modified transport stream together with the auxiliary information into a medium.

41. (Previously presented) The method of claim 40 wherein the medium includes one or more of a record carrier, and a cable, and a satellite.